

FIG. 1
(PRIOR ART)

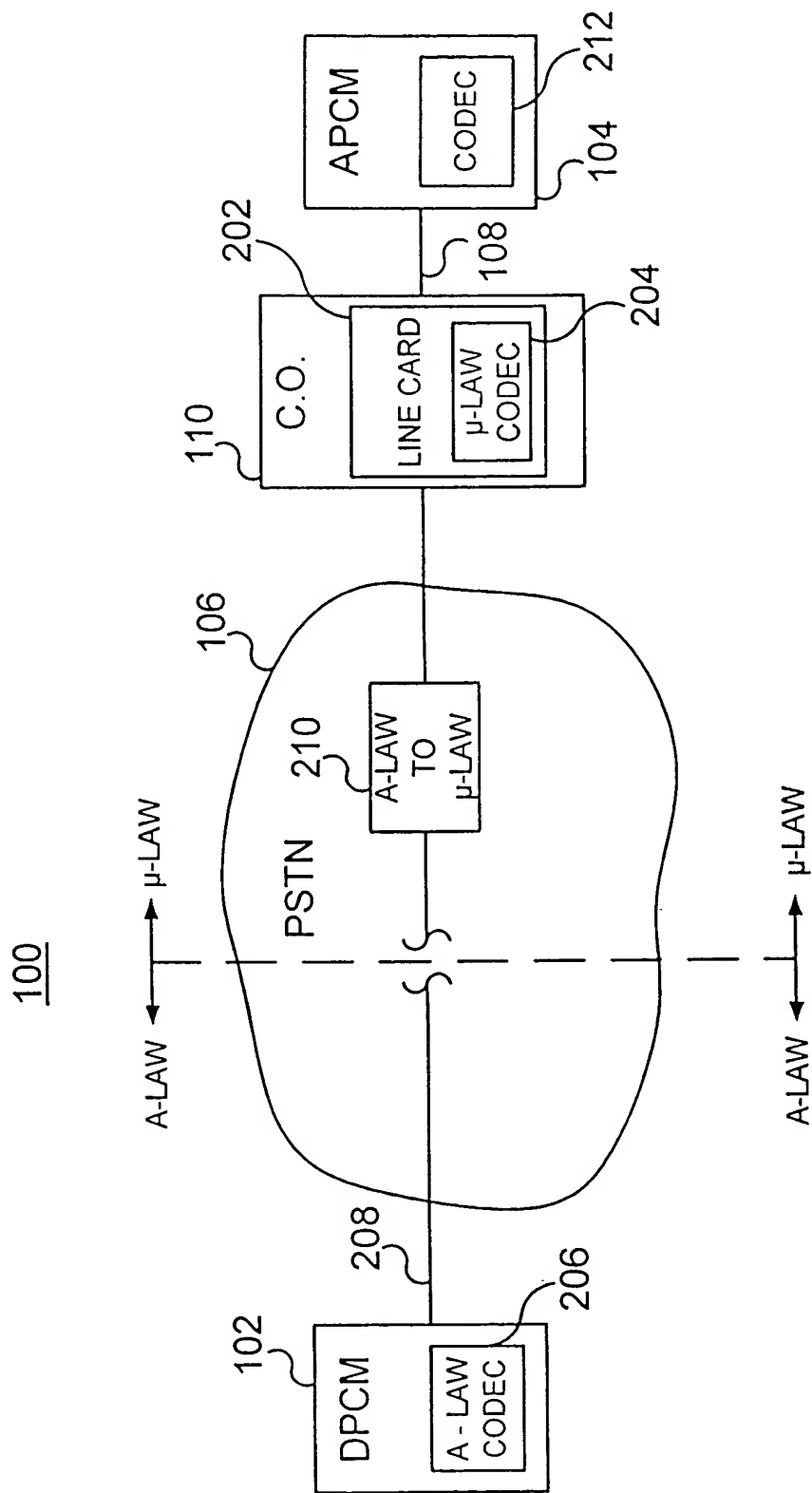


FIG.2
(PRIOR ART)

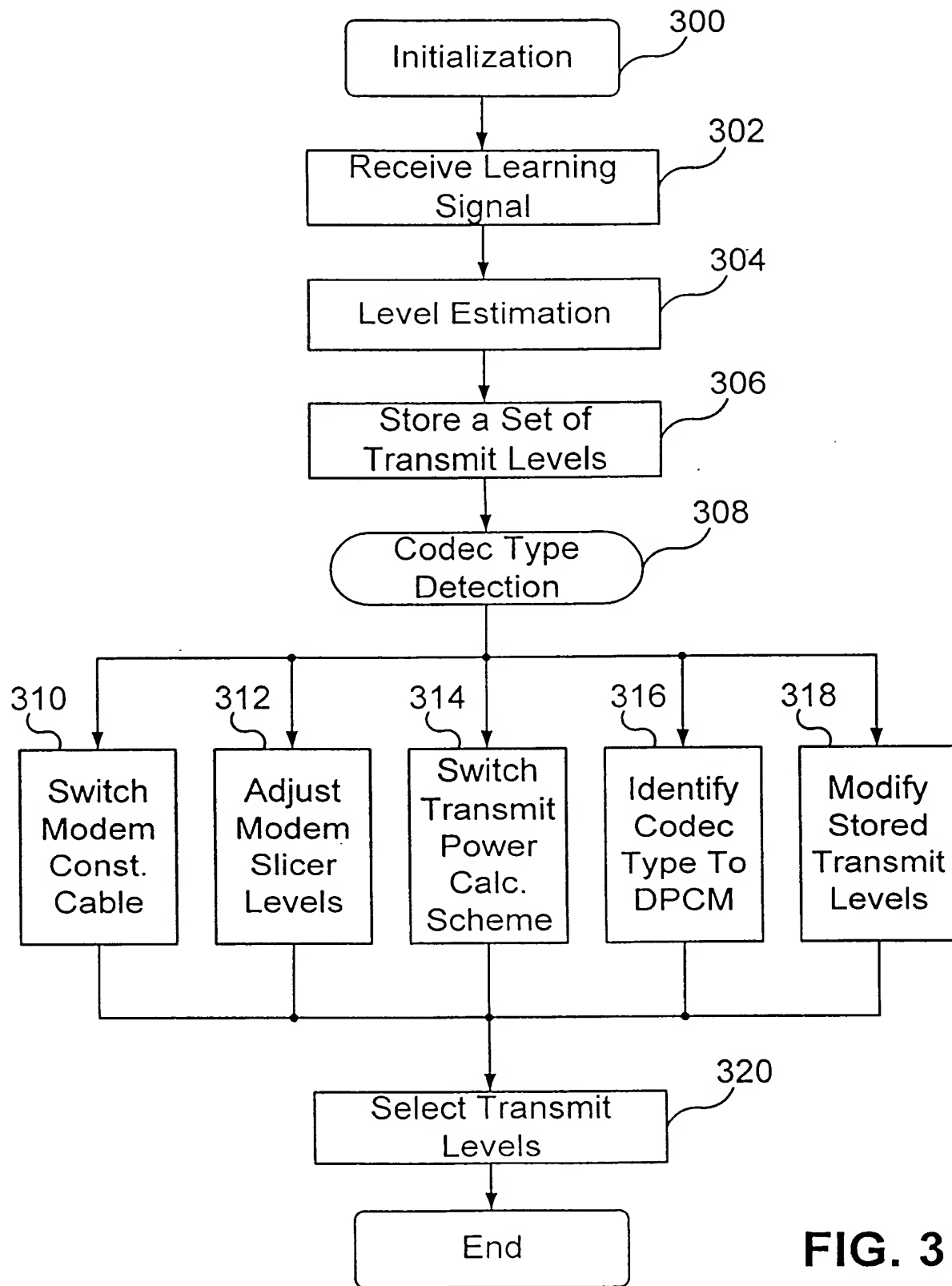


FIG. 3

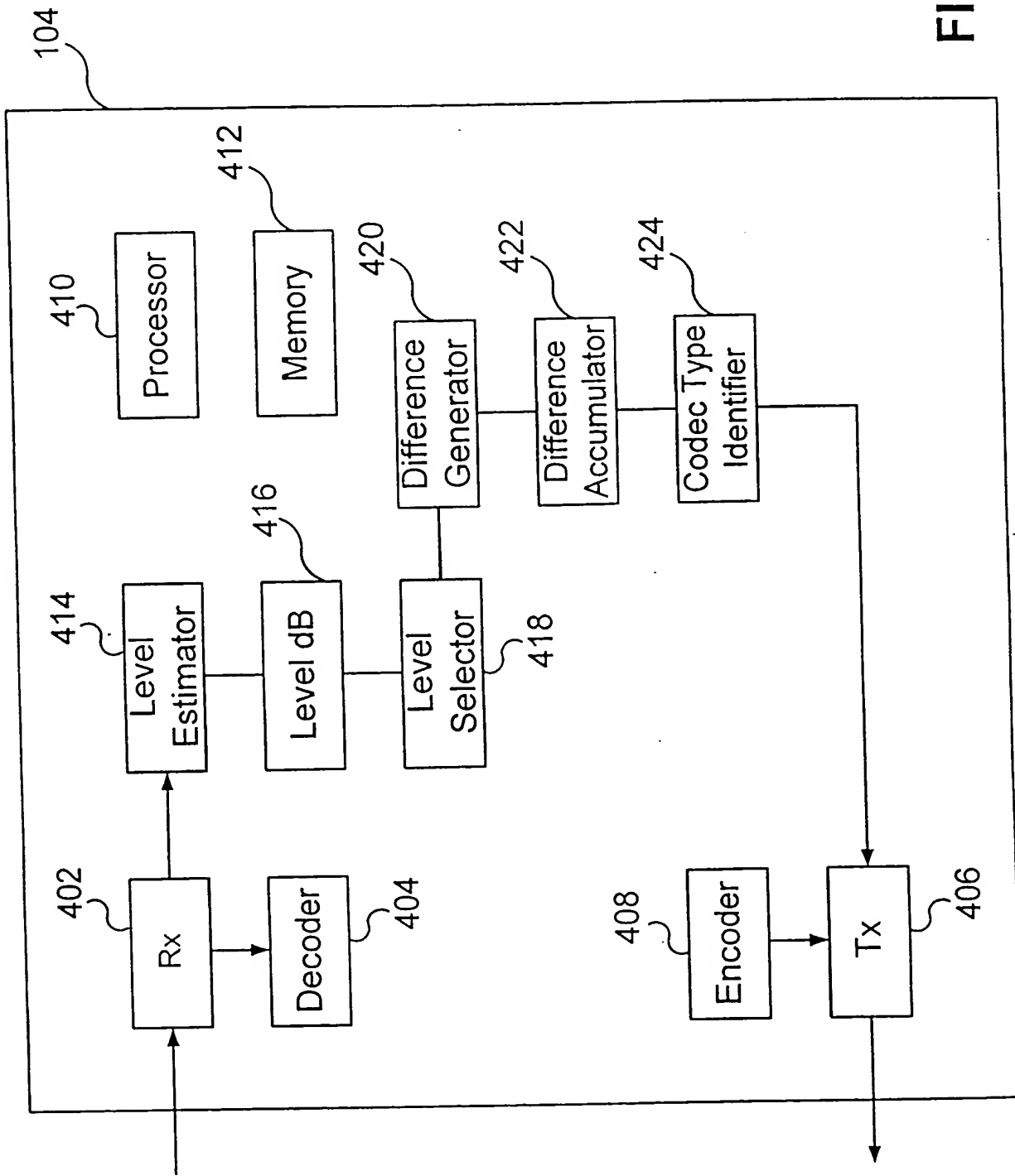


FIG. 4

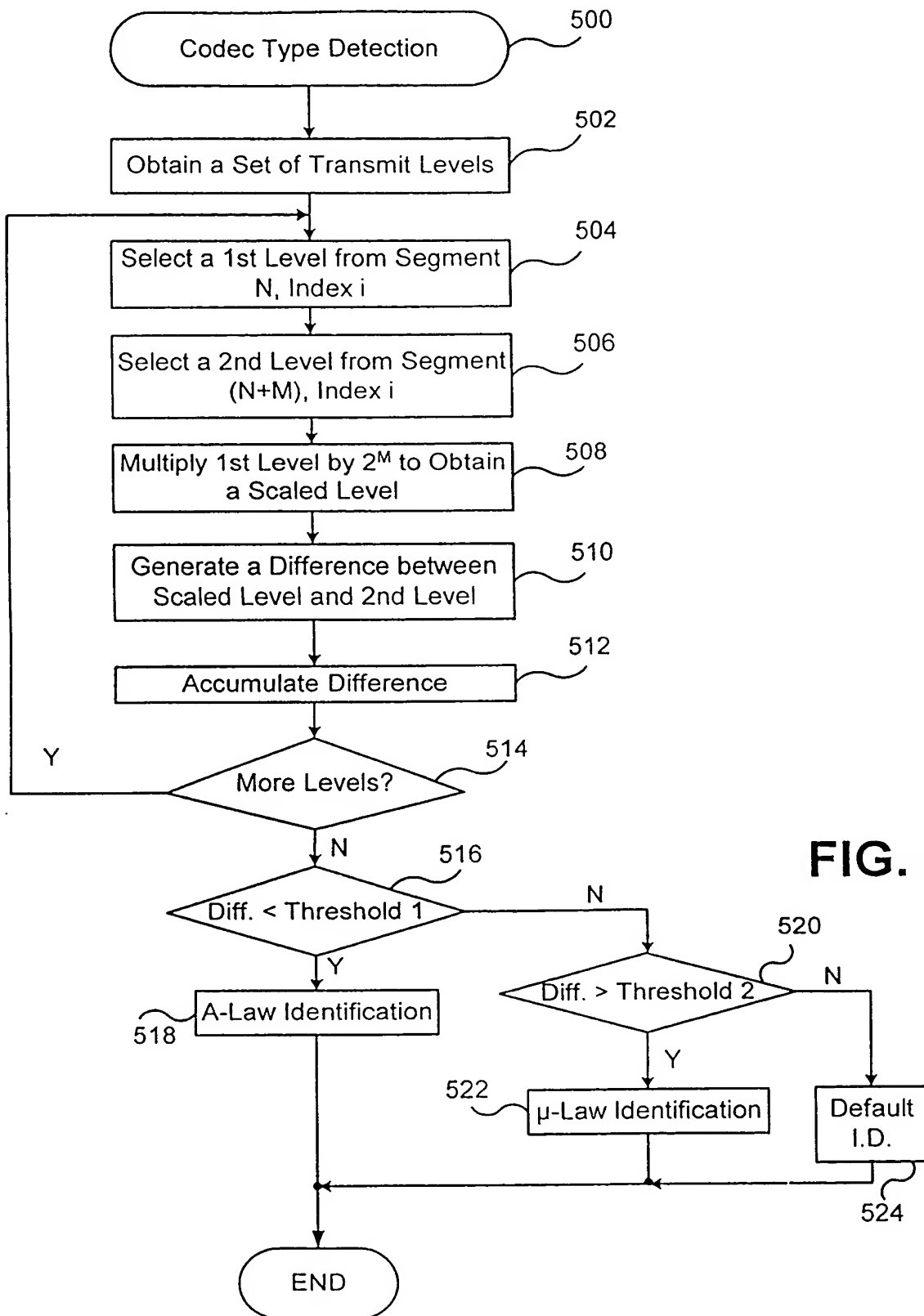


FIG. 5

FIG. 6-1

The universal set of PCM codewords

| Ucode | μ -low PCM | μ -low linear | A-low PCM | A-low linear |
|-------|----------------|-------------------|-----------|--------------|
| 0 | FF | 0 | D5 | 8 |
| 1 | FE | 8 | D4 | 24 |
| 2 | FD | 16 | D7 | 40 |
| 3 | FC | 24 | D6 | 56 |
| 4 | FB | 32 | D1 | 72 |
| 5 | FA | 40 | D0 | 88 |
| 6 | F9 | 48 | D3 | 104 |
| 7 | F8 | 56 | D2 | 120 |
| 8 | F7 | 64 | DD | 136 |
| 9 | F6 | 72 | DC | 152 |
| 10 | F5 | 80 | DF | 168 |
| 11 | F4 | 88 | DE | 184 |
| 12 | F3 | 96 | D9 | 200 |
| 13 | F2 | 104 | D8 | 216 |
| 14 | F1 | 112 | DB | 232 |
| 15 | F0 | 120 | DA | 248 |
| 0 | EF | 132 | C5 | 264 |
| 17 | EE | 148 | C4 | 280 |
| 18 | ED | 164 | C7 | 296 |
| 19 | EC | 180 | C6 | 312 |
| 20 | EB | 196 | C1 | 328 |
| 5 | EA | 212 | C0 | 344 |
| 22 | E9 | 228 | C3 | 360 |
| 23 | E8 | 244 | C2 | 376 |
| 24 | E7 | 260 | CD | 392 |
| 25 | E6 | 276 | CC | 408 |
| 10 | E5 | 292 | CF | 424 |
| 27 | E4 | 308 | CE | 440 |
| 28 | E3 | 324 | C9 | 456 |
| 29 | E2 | 340 | C8 | 472 |
| 30 | E1 | 356 | CB | 488 |
| 15 | E0 | 372 | CA | 504 |
| 0 | DF | 396 | F5 | 528 |
| 33 | DE | 428 | F4 | 560 |
| 34 | DD | 460 | F7 | 592 |
| 35 | DC | 492 | F6 | 624 |
| 36 | DB | 524 | F1 | 656 |
| 5 | DA | 556 | F0 | 688 |
| 38 | D9 | 588 | F3 | 720 |
| 39 | D8 | 620 | F2 | 752 |
| 40 | D7 | 652 | FD | 784 |
| 41 | D6 | 684 | FC | 816 |
| 10 | D5 | 716 | FF | 848 |
| 43 | D4 | 748 | FE | 880 |
| 44 | D3 | 780 | F9 | 912 |
| 45 | D2 | 812 | F8 | 944 |
| 46 | D1 | 844 | FB | 976 |
| 15 | D0 | 876 | FA | 1008 |
| 0 | CF | 924 | E5 | 1056 |
| 49 | CE | 988 | E4 | 1120 |
| 50 | CD | 1052 | E7 | 1184 |
| 51 | CC | 1116 | E6 | 1248 |
| 52 | CB | 1180 | E1 | 1312 |
| 5 | CA | 1244 | E0 | 1376 |
| 54 | C9 | 1308 | E3 | 1440 |
| 55 | C8 | 1372 | E2 | 1504 |
| 56 | C7 | 1436 | ED | 1568 |
| 57 | C6 | 1500 | EC | 1632 |
| 10 | C5 | 1564 | EF | 1696 |
| 59 | C4 | 1628 | EE | 1760 |
| 60 | C3 | 1692 | E9 | 1824 |
| 61 | C2 | 1756 | E8 | 1888 |
| 62 | C1 | 1820 | EB | 1952 |
| 15 | C0 | 1884 | EA | 2016 |

The universal set of PCM codewords

| Ucode | μ -low PCM | μ -low linear | A-low PCM | A-low linear | |
|-------|----------------|-------------------|-----------|--------------|----|
| 64 | BF | 1980 | 95 | 2112 | 0 |
| 65 | BE | 2108 | 94 | 2240 | |
| 66 | BD | 2236 | 97 | 2368 | |
| 67 | BC | 2364 | 96 | 2496 | |
| 68 | BB | 2492 | 91 | 2624 | |
| 69 | BA | 2620 | 90 | 2752 | 5 |
| 70 | B9 | 2748 | 93 | 2880 | |
| 71 | B8 | 2876 | 92 | 3008 | |
| 72 | B7 | 3004 | 9D | 3136 | |
| 73 | B6 | 3132 | 9C | 3264 | |
| 74 | B5 | 3260 | 9F | 3392 | 10 |
| 75 | B4 | 3388 | 9E | 3520 | |
| 76 | B3 | 3516 | 99 | 3648 | |
| 77 | B2 | 3644 | 98 | 3776 | |
| 78 | B1 | 3772 | 9B | 3904 | |
| 79 | B0 | 3900 | 9A | 4032 | 15 |
| 80 | AF | 4092 | 85 | 4224 | 0 |
| 81 | AE | 4348 | 84 | 4480 | |
| 82 | AD | 4604 | 87 | 4736 | |
| 83 | AC | 4860 | 86 | 4992 | |
| 84 | AB | 5116 | 81 | 5248 | |
| 85 | AA | 5372 | 80 | 5504 | 5 |
| 86 | A9 | 5628 | 83 | 5760 | |
| 87 | A8 | 5884 | 82 | 6016 | |
| 88 | A7 | 6140 | 8D | 6272 | |
| 89 | A6 | 6396 | 8C | 6528 | 10 |
| 90 | A5 | 6652 | 8F | 6784 | |
| 91 | A4 | 6908 | 8E | 7040 | |
| 92 | A3 | 7164 | 89 | 7296 | |
| 93 | A2 | 7420 | 88 | 7552 | |
| 94 | A1 | 7676 | 8B | 7808 | 15 |
| 95 | A0 | 7932 | 8A | 8064 | 0 |
| 96 | 9F | 8316 | B5 | 8448 | |
| 97 | 9E | 8828 | B4 | 8960 | |
| 98 | 9D | 9340 | B7 | 9472 | |
| 99 | 9C | 9852 | B6 | 9984 | |
| 100 | 9B | 10364 | B1 | 10496 | 5 |
| 101 | 9A | 10876 | B0 | 11008 | |
| 102 | 99 | 11388 | B3 | 11520 | |
| 103 | 98 | 11900 | B2 | 12032 | |
| 104 | 97 | 12412 | BD | 12544 | |
| 105 | 96 | 12924 | BC | 13056 | 10 |
| 106 | 95 | 13436 | BF | 13568 | |
| 107 | 94 | 13948 | BE | 14080 | |
| 108 | 93 | 14460 | B9 | 14592 | |
| 109 | 92 | 14972 | B8 | 15104 | |
| 110 | 91 | 15484 | BB | 15616 | 15 |
| 111 | 90 | 15996 | BA | 16128 | 0 |
| 112 | 8F | 16764 | A5 | 16896 | |
| 113 | 8E | 17788 | A4 | 17920 | |
| 114 | 8D | 18812 | A7 | 18944 | |
| 115 | 8C | 19836 | A6 | 19968 | |
| 116 | 8B | 20860 | A1 | 20992 | 5 |
| 117 | 8A | 21884 | A0 | 22016 | |
| 118 | 89 | 22908 | A3 | 23040 | |
| 119 | 88 | 23932 | A2 | 24064 | |
| 120 | 87 | 24956 | AD | 25088 | |
| 121 | 86 | 25980 | AC | 26112 | 10 |
| 122 | 85 | 27004 | AF | 27136 | |
| 123 | 84 | 28028 | AE | 28160 | |
| 124 | 83 | 29052 | A9 | 29184 | |
| 125 | 82 | 30076 | A8 | 30208 | |
| 126 | 81 | 31100 | AB | 31232 | 15 |
| 127 | 80 | 32124 | AA | 32256 | |

FIG. 6-2

A-low, positive input values

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|----------------|-------------------------------------|-----------------------------|---------------------------|-----------------------------------|--|---|-----------------------------|
| Segment number | Number of intervals x interval size | Value at segment end points | Decision value number n | Decision value x_n (see Note 1) | Character signal before inversion of the even bits | Quantized value (value at decoder output) y_n | Decoder output value number |
| | | | | | Bit number 1 2 3 4 5 6 7 8 | | |
| 7 | 16 x 128 | 4096 | (128) | (4096) | ----- | 4032 | 128 |
| | | | 127 | 3968 | 1 1 1 1 1 1 1 1 | | |
| | | | 113 | 2176 | (see Note 2) | | |
| 6 | 16 x 64 | 2048 | 112 | 2048 | 1 1 1 1 0 0 0 0 | 2112 | 113 |
| | | | 97 | 1088 | (see Note 2) | | |
| | | | 96 | 1024 | 1 1 1 0 0 0 0 0 | | |
| 5 | 16 x 32 | 1024 | 81 | 544 | (see Note 2) | 1056 | 97 |
| | | | 80 | 512 | 1 1 0 1 0 0 0 0 | | |
| | | | 65 | 272 | (see Note 2) | | |
| 4 | 16 x 16 | 256 | 64 | 256 | 1 1 0 0 0 0 0 0 | 264 | 65 |
| | | | 49 | 136 | (see Note 2) | | |
| | | | 48 | 128 | 1 0 1 1 0 0 0 0 | | |
| 3 | 16 x 8 | 128 | 33 | 68 | (see Note 2) | 132 | 49 |
| | | | 32 | 64 | 1 0 1 0 0 0 0 0 | | |
| | | | 1 | 2 | (see Note 2) | | |
| 2 | 16 x 4 | 64 | 0 | 0 | 1 0 0 0 0 0 0 0 | 66 | 33 |
| | | | | | (see Note 2) | | |
| | | | | | | | |
| 1 | 32 x 2 | | | | | | |
| 0 | | | | | | | |

FIG. 7

FIG. 8

 μ -A conversion

| μ -law Decoder output value number | A-law Decoder output value number | μ -law Decoder output value number | A-law Decoder output value number |
|--|---|--|---|
| 0 | 1 | 44 | 41 |
| 1 | 1 | 45 | 42 |
| 2 | 2 | 46 | 43 |
| 3 | 2 | 47 | 44 |
| 4 | 3 | 48 | 46 |
| 5 | 3 | 49 | 48 |
| 6 | 4 | 50 | 49 |
| 7 | 4 | 51 | 50 |
| 8 | 5 | 52 | 51 |
| 9 | 5 | 53 | 52 |
| 10 | 6 | 54 | 53 |
| 11 | 6 | 55 | 54 |
| 12 | 7 | 56 | 55 |
| 13 | 7 | 57 | 56 |
| 14 | 8 | 58 | 57 |
| 15 | 8 | 59 | 58 |
| 16 | 9 | 60 | 59 |
| 17 | 10 | 61 | 60 |
| 18 | 11 | 62 | 61 |
| 19 | 12 | 63 | 62 |
| 20 | 13 | 64 | 64 |
| 21 | 14 | 65 | 65 |
| 22 | 15 | 66 | 66 |
| 23 | 16 | 67 | 67 |
| 24 | 17 | 68 | 68 |
| 25 | 18 | 69 | 69 |
| 26 | 19 | 70 | 70 |
| 27 | 20 | 71 | 71 |
| 28 | 21 | 72 | 72 |
| 29 | 22 | 73 | 73 |
| 30 | 23 | 74 | 74 |
| 31 | 24 | 75 | 75 |
| 32 | 25 | 76 | 76 |
| 33 | 27 | 77 | 77 |
| 34 | 29 | 78 | 78 |
| 35 | 31 | 79 | 79 |
| 36 | 33 | 80 | 81 |
| 37 | 34 | 81 | 82 |
| 38 | 35 | 82 | 83 |
| 39 | 36 | 83 | 84 |
| 40 | 37 | 84 | 85 |
| 41 | 38 | 85 | 86 |
| 42 | 39 | 86 | 87 |
| 43 | 40 | 87 | 88 |
| | | . | . |
| | | . | . |
| | | . | . |
| | | 127 | 128 |